

# 1. AMENDMENT AND LISTING OF CLAIMS

*This listing of claims will replace all prior versions and listings of claims in the application.*

1. (Currently Amended) A continuously variable transmission (CVT) fluid, comprising [or obtained by mixing: ]a substantially fully-hydrogenated cyclic dimer of an  $\alpha$ -alkyl styrene prepared by the method of claim 21; and a low temperature viscosity control agent, wherein [the ]said fluid comprises less than about 20 wt % of a linear dimer of [the ]said  $\alpha$ -alkyl styrene, and further wherein said [the ]fluid has a kinematic viscosity of greater than about  $[2.5 \times 10^{-6} \text{ m}^2/\text{s}]$  $2.5 \times 10^{-6} \text{ m}^2/\text{s}$  at 100°C, as measured according to ASTM D-445.

2. (Currently Amended) The CVT fluid of claim 1, wherein the kinematic viscosity of [the ]said fluid is greater than about  $[3.0 \times 10^{-6} \text{ m}^2/\text{s}]$  $3.0 \times 10^{-6} \text{ m}^2/\text{s}$  at 100°C.

3. (Currently Amended) The CVT fluid of claim 1, wherein the kinematic viscosity of [the]said fluid is from about  $[3.0 \times 10^{-6} \text{ m}^2/\text{s}]$  $3.0 \times 10^{-6} \text{ m}^2/\text{s}$  at 100°C. to about  $[8.0 \times 10^{-6} \text{ m}^2/\text{s}]$  $8.0 \times 10^{-6} \text{ m}^2/\text{s}$  at 100°C.

4. (Currently Amended) The CVT fluid of claim 1, wherein the kinematic viscosity of [the]said fluid is greater than about  $[8.0 \times 10^{-6} \text{ m}^2/\text{s}]$  $8.0 \times 10^{-6} \text{ m}^2/\text{s}$  at 100°C.

5. (Original) The CVT fluid of claim 1, wherein the fluid has a traction coefficient (100°C.) of at least about 0.08.

6. (Currently Amended) The CVT fluid of claim 1, wherein the fluid has a traction coefficient (100°C.) [form]from about 0.08 to about 0.109.

7. (Original) The CVT fluid of claim 1, wherein the fluid has a traction coefficient (100°C.) of at least about 0.109.

8. (Original) The CVT fluid of claim 1, wherein the fluid has a Brookfield viscosity (-30°C.) of less than about 100 Pa•s.

9. (Original) The CVT fluid of claim 1, wherein the fluid has a Brookfield viscosity (-30°C.) of from about 100 Pa•s to about 5 Pa•s.

10. (Original) The CVT fluid of claim 1, wherein the fluid has a Brookfield viscosity (-30°C.) of less than about 5 Pa•s.

11. (Original) The CVT fluid of claim 1, wherein the hydrogenated cyclic dimer of  $\alpha$ -alkyl styrene is present in greater than about 80 wt %.
12. (Original) The CVT fluid of claim 1, wherein the hydrogenated cyclic dimer of  $\alpha$ -alkyl styrene is present in greater than about 85 wt %.
13. (Original) The CVT fluid of claim 1, wherein the hydrogenated cyclic dimer of  $\alpha$ -alkyl styrene is present in greater than about 90 wt %.
14. (Original) The CVT fluid of claim 1, wherein the low temperature viscosity control agent has a viscosity of greater than  $2.5 \times 10^{-6} \text{ m}^2/\text{s}$  at  $100^\circ\text{C}$ .
15. (Original) The CVT fluid of claim 1, further comprising an additive selected from dispersants, detergents, viscosity index improvers, friction modifiers, anti-wear agents, or mixtures thereof.

16. (Original) The CVT fluid of claim 1, wherein the low temperature viscosity control agent is selected from oligomers or polymers of linear alpha olefins of at least 12 carbon atoms, naphthenic oils, synthetic ester oils, polyether oils, or mixtures thereof.
17. (Currently Amended) The CVT fluid of claim 1, wherein the low temperature viscosity control agent has a viscosity of less than  $[2.5 \times 10^{-6}] 2.5 \times 10^{-6} \text{ m}^2/\text{s}$  at 100 °C.
18. (Original) The CVT fluid of claim 1, wherein the low temperature viscosity control agent comprises an oligomer or polymer of linear alpha olefins having 12 to about 20 carbon atoms, said oligomer or polymer having a molecular weight of about 250 to about 600.
19. (Original) The CVT fluid of claim 1, wherein the low temperature viscosity control agent comprises a naphthenic oil.
20. (Original) The CVT fluid of claim 1, wherein the  $\alpha$ -alkyl styrene is  $\alpha$ -methyl styrene.
21. (Currently Amended) A method of making a substantially fully-hydrogenated cyclic dimerized  $\alpha$ -alkyl styrene [and products thereof], said method comprising: (a) contacting an  $\alpha$ -

alkyl styrene with a supported acid catalyst in the absence of a solvent and substantially in the absence of free acid under a temperature and pressure condition to effect oligomerization of [the]said  $\alpha$ -alkyl styrene to produce an oligomerization product[, the oligomerization product comprising] that comprises a cyclic dimer of [the]said  $\alpha$ -alkyl styrene; and (b) hydrogenating [the]said cyclic dimer [of the  $\alpha$ -alkyl styrene ]in the presence of a hydrogenation catalyst to produce substantially a fully-hydrogenated cyclic dimer of [the]said  $\alpha$ -alkyl styrene[, wherein the  $\alpha$ -alkyl styrene is contacted with the supported acid catalyst in the absence of a solvent for the  $\alpha$ -alkyl styrene and a free acid].

22. (Currently Amended) The method of claim 21, further comprising mixing [the]said fully-hydrogenated cyclic dimer with an additive to form a continuously variable transmission fluid, wherein [the ]said continuously variable transmission fluid comprises less than about 20 wt. % of a linear dimer of [the]said  $\alpha$ -alkyl styrene.

23. (Currently Amended) The method of claim 22, wherein [the]said transmission fluid comprises less than about 5 wt. % of a trimer or higher oligomer of [the]said  $\alpha$ -alkyl styrene.

24. (Currently Amended) The method of claim [22]21, wherein [the ]said  $\alpha$ -alkyl styrene is  $\alpha$ -methyl styrene.

25. (Currently Amended) The method of claim [24]21, wherein [the]said fully-hydrogenated cyclic dimer is [1-cyclohexyl-1,1,3-trimethylhydrindane]1-cyclohexyl-1,3,3-trimethylhydrindane.

26. (Currently Amended) The method of claim 25, wherein [the 1-cyclohexyl-1,1,3-trimethylhydrin- dane]said 1-cyclohexyl-1,3,3-trimethylhydrindane is mixed with an oil additive to form a continuously variable transmission fluid.

27. (Canceled)

28. (Currently Amended) The method of claim [26]21, wherein the [transmission fluid] product of said oligomerization comprises less than about [5]8 wt. % of a trimer or higher oligomer of [ $\alpha$ -methyl styrene ]said  $\alpha$ -alkyl styrene.

29. (Currently Amended) The method of claim [22]21, wherein the supported acid catalyst is a column of an acidic ion exchange resin.

30. (Original) The method of claim 29, wherein the acidic ion exchange resin is a strongly acidic ion exchange resin.

31. (Currently Amended) The method of claim [29]21, wherein [the]said  $\alpha$ -alkyl styrene is passed through [the acidic resin exchange resin column ]said supported acid catalyst at a temperature from about 25°C. to about 250°C.

32. (Currently Amended) The method of claim 31, wherein said supported acid catalyst is an acidic ion exchange resin column and [the]said  $\alpha$ -alkyl styrene has a residence time in [the acidic ion exchange ]said acidic ion exchange resin column column in the range of from about 1 second to about 250 minutes.

33. (Currently Amended) The method of claim [29]32, wherein [the]said acidic ion exchange resin column has a column pressure in the range from about 15 psig (103 kPa) to about 44 psig (303 kPa).

34. (Currently Amended) The method of claim 21, further comprising separating the cyclic dimer of [the]said  $\alpha$ -alkyl styrene from other oligomers of [the]said  $\alpha$ -alkyl styrene prior to the hydrogenation of the cyclic dimer.

35. (New) The method of claim 21, wherein said  $\alpha$ -alkyl styrene is contacted with said supported acid catalyst completely in the absence of free or unsupported acid.
36. (New) The method of claim 21, wherein said oligomerization product comprises 1-phenyl-1,3,3-trimethylindane.
37. (New) The method of claim 21, wherein said oligomerization product comprises less than about 18 wt. % of a linear dimer of said  $\alpha$ -alkyl styrene.
38. (New) The method of claim 37, wherein said oligomerization product comprises less than about 6 wt. % of a linear dimer of said  $\alpha$ -alkyl styrene.
39. (New) The method of claim 38, wherein said oligomerization product comprises less than about 5 wt. % of a linear dimer of said  $\alpha$ -alkyl styrene.



40. (New) The method of claim 39, wherein said oligomerization product comprises less than about 3 wt. % of a linear dimer of said  $\alpha$ -alkyl styrene.

41. (New) The method of claim 21, wherein said oligomerization product comprises 1-phenyl-1,3,3-trimethylhydrindane substantially in the absence of a linear dimer of  $\alpha$ -methyl styrene.

42. (New) The method of claim 21, wherein said oligomerization product comprises less than about 5 wt. % of a trimer or higher oligomer of said  $\alpha$ -alkyl styrene.

43. (New) The method of claim 42, wherein said oligomerization product comprises less than about 4 wt. % of a trimer or higher oligomer of said  $\alpha$ -alkyl styrene.

44. (New) The method of claim 43, wherein said oligomerization product comprises less than about 2 wt. % of a trimer or higher oligomer of said  $\alpha$ -alkyl styrene.

45. (New) The method of claim 44, wherein said oligomerization product comprises less than about 1 wt. % of a trimer or higher oligomer of said  $\alpha$ -alkyl styrene.

46. (New) The method of claim 21, wherein said oligomerization product comprises 1-phenyl-1,3,3-trimethylhydrindane substantially in the absence of a trimer or higher oligomer of  $\alpha$ -methyl styrene.

47. (New) The method of claim 21, wherein said fully-hydrogenated cyclic dimer is substantially free of a linear dimer, a trimer or higher oligomer of said  $\alpha$ -alkyl styrene.

48. (New) The method of claim 47, wherein said fully-hydrogenated cyclic dimer is substantially free of a linear dimer, a trimer or higher oligomer of said  $\alpha$ -alkyl styrene.

49. (New) The method of claim 48, wherein said fully-hydrogenated cyclic dimer is substantially free of linear dimers, trimers and higher oligomers of said  $\alpha$ -alkyl styrene.

50. (New) The method of claim 21, further comprising mixing said fully-hydrogenated cyclic dimer with an additive to form a continuously variable transmission fluid, wherein said continuously variable transmission fluid is substantially free of a linear dimer of said  $\alpha$ -alkyl styrene.

51. (New) The method of claim 50, wherein said fully-hydrogenated cyclic dimer is 1-cyclohexyl-1,3,3-trimethylhydrindane.

52. (New) A method of producing a cyclic dimerized  $\alpha$ -alkyl styrene substantially in the absence of a linear dimer or a trimer of said  $\alpha$ -alkyl styrene, said method comprising: (a) contacting an  $\alpha$ -alkyl styrene with a supported acid catalyst in the absence of a solvent and substantially in the absence of free acid under a temperature and pressure condition effective to produce an oligomerization product and (b) hydrogenating said oligomerization product in the presence of a hydrogenation catalyst sufficient to produce a fully-hydrogenated cyclic dimer of said  $\alpha$ -alkyl styrene substantially in the absence of said linear dimer or said trimer.

53. (New) The method of claim 52, wherein said  $\alpha$ -alkyl styrene is  $\alpha$ -methyl styrene.

54. (New) The method of claim 52, wherein hydrogenation catalyst comprises nickel on kieselguhr, nickel on silica/alumina, Raney nickel, palladium on carbon, or platinum.

55. (New) The method of claim 52, wherein said supported acid catalyst comprises acidic sulfonated divinylbenzene/styrene copolymer.
56. (New) The method of claim 52, wherein said cyclic dimerized  $\alpha$ -alkyl styrene is 1-cyclohexyl-1,3,3-trimethylhydrindane.
57. (New) A continuously variable transmission (CVT) fluid, comprising: (a) a fully-hydrogenated cyclic dimer of  $\alpha$ -alkyl styrene prepared by the method of claim 21; and (b) a low-temperature viscosity control agent.